U.S. Forest Service
Pacific Southwest Library and Information Center
1323 Club Drive
Vallejo, CA 94592-1110

WESTERN REDCEDAR

. . . an American wood

Western redcedar is one of the larger, slower growing, and longest living trees found in the Pacific Northwest and adjacent areas. Some trees are more than 1,000 years old and 12 feet in diameter. It is typically found in moist bottomlands mixed with other conifers. The wood is naturally resistant to decay and is used extensively for telephone and transmission poles. It is also one of the principal woods for shingles, split shakes, split posts, rails, and grape stakes. It is also used extensively for siding because of its high paint-holding ability and freedom from shrinkage and warping. Knot-free lumber is used for decorative paneling and has high value as lining for cedar closets or cabinets.

SD
11
.A1
A42
NO.261
1973

FS-261
October 1973
U.S. Department of Agriculture Forest Service

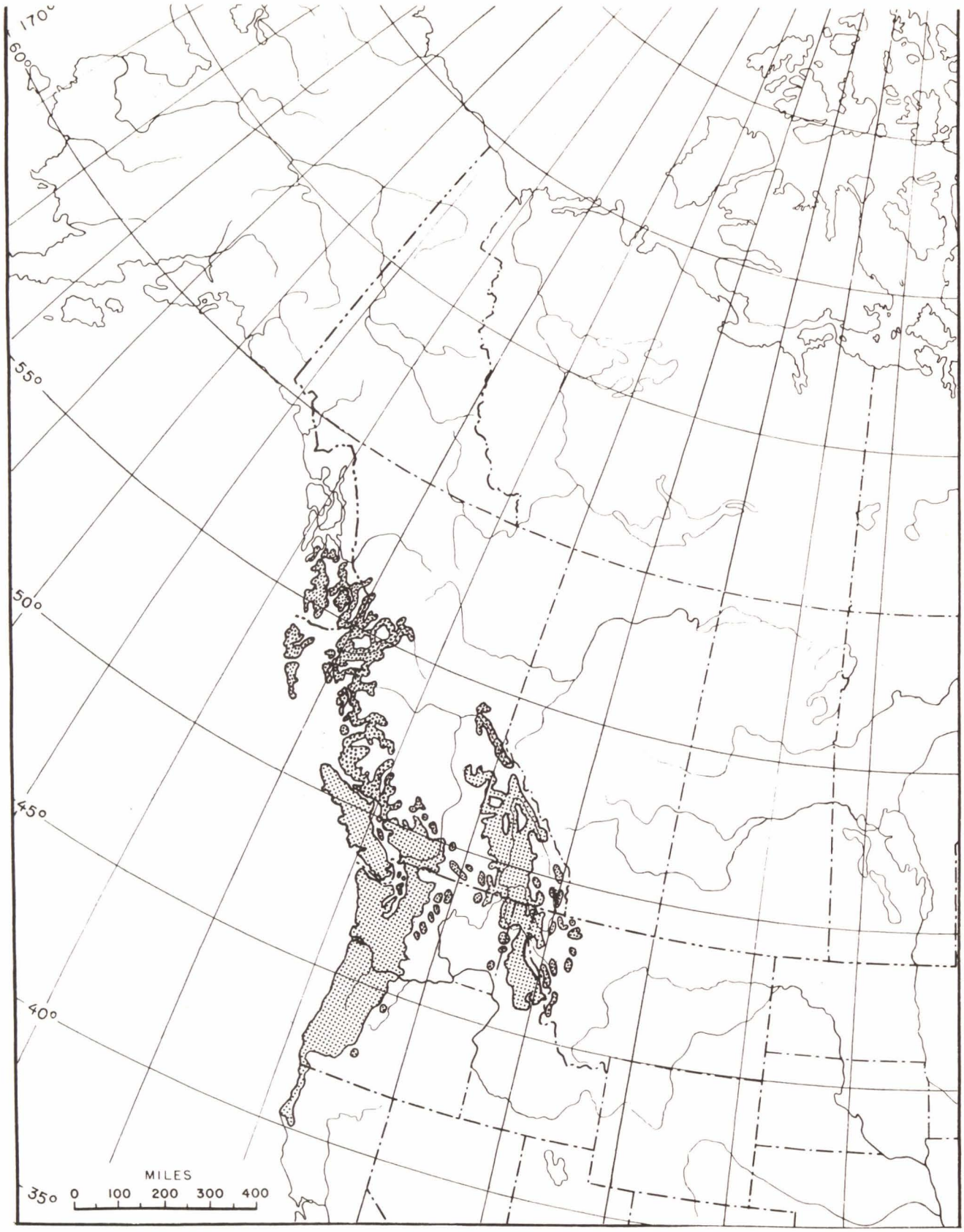

Figure 1.—Natural range of western redcedar.

Cover: F-388357

WESTERN REDCEDAR

. . . an American wood

Edward S. Kotok[1]

DISTRIBUTION

Western redcedar (*Thuja plicata* Donn) grows from the coastal regions of southern Alaska south through the coastal ranges of British Columbia, through western Washington and Oregon to Humbolt County in California. From the British Columbia coast, it grows east to the western slope of the Continental Divide and thence south into the Selkirk and Bitterroot Mountains of Idaho.

Western redcedar generally grows on moist flats, terraces, and gentle lower slopes and in most stream bottoms, gulches, and ravines. Occasionally it grows on moderately dry and warm sites, but its growth under such conditions is poor.

On the Pacific coast, western redcedar grows from sea level to an elevation of about 3,000 feet. Inland, in Idaho, Montana, and northeastern Washington, it grows at elevations between 2,000 and 7,000 feet. Its important commercial range is between sea level and 3,000 feet in the coastal areas and below 5,000 feet inland. It rarely occurs in pure stands, except in small areas. Its more common associates include western hemlock (*Tsuga heterophylla*), Sitka spruce (*Picea sitchensis*), Port-Orford-cedar (*Chamaecyparis lawsoniana*), redwood (*Sequoia sempervirens*), western white pine (*Pinus monticola*), Engelmann spruce (*Picea engelmannii*), the true firs (*Abies*), and Douglas-fir (*Pseudotsuga Menziesii*). Several hardwoods that favor moist sites also grow intermixed with western redcedar, including big-leaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*), and northern black cottonwood (*Populus trichocarpa*). Typical timber stands also include a rich flora of lesser vegetation such as mosses, ferns, perennial herbs, and shrubs.

[1] Chief, Structural and Forest Systems Engineering Research, USDA Forest Service, Washington, D.C.

NOTE: This publication supersedes unnumbered publication *Western Redcedar*, issued 1954.

DESCRIPTION AND GROWTH

Western redcedar is the larger of the two American arborvitae (the other being northern white cedar) and grows to magnificent size and age. It frequently attains breast-high diameters in excess of 8 feet even in its inland growing sites. The largest diameter recorded is 16 feet. The better growing sites of the Pacific areas produce specimens higher than 200 feet. Even in the inland area, heights of 175 feet are not uncommon. The trunk in older trees is heavily root-buttressed and rapidly tapering. The crown is generally irregular, but full, with drooping branches which bend upward at the end to form a distinctive hook. The leaves are a lustrous dark yellow-green, which is a typical color of the arborvitae.

The cones, which are larger than the leaves, become brown and woody when mature and open into small clusterlike scales (fig. 2). Good seed crops occur at least every 3 years, with as many as 1 million seeds falling per acre. Seed-fall begins in late August or early September.

The bark of western redcedar is generally about ¾-inch thick, a distinctive cinnamon red color, and divided into thin, fibrous, interlacing ridges (fig. 3). It is the fibrous character that most clearly distinguishes the bark. The fully developed root system and large buttresses make western redcedar relatively windfirm, but is less firm than some of its associates.

Western redcedar grows in the shade of overtopping trees better than most of its associated species. This characteristic enables it eventually to occupy the site to the exclusion of most species. It is usually a member of the climax plant community.

COMMON NAMES

Western redcedar is known by several common names, including giant arborvitae, arborvitae, canoe cedar, shinglewood, Pacific redcedar, giant cedar, and

F-521747

Figure 2.—Foliage and cones of western redcedar.

F-309007

Figure 3.—Bark of western redcedar.

cedar. It is often confused with Port-Orford-cedar and incense cedar, both members of the family Cupressaceae.

RELATED COMMERCIAL SPECIES

Western redcedar is almost always sold under its own name. However, it is used in many instances interchangeably with Port-Orford-cedar, incense cedar, and redwood.

SUPPLY

There are 46 billion board feet of western redcedar saw-timber in the United States; three-fourths of this is in Washington and Oregon. The balance occurs in Alaska, Idaho, and Montana, with a small amount in California. An estimated 8.5 billion cubic feet of western redcedar growing stock occurs in these same States.

PRODUCTION

Western redcedar lumber was produced at an average of about 250 million board feet per year from 1915 until 1952. From 1952 its production steadily increased, reaching about 472 million board feet in 1963 (fig. 4). This last year was the highest lumber production on record for the species. There is no accurate estimate of the volume of western redcedar split products, but in 1963 an estimated $43 million worth was produced. These products include shakes, fenceposts, rails, grape stakes, archery arrow shafts, and novelty items.

Western redcedar is used for telephone and transmission poles. Estimated pole production for Montana, Idaho, and western Washington has averaged about 164,000 poles for the 5 years prior to 1962. In 1957 an estimated 281,000 poles were produced in those States.

There is no accurate estimate available of the volume of western redcedar that is manufactured into decorative plywood, but it is a significant amount.

Western redcedar has few insect enemies and suffers little from their damage. Diseases, likewise, play a relatively minor role in coastal western redcedar stands, but are of greater importance inland. Brown cubicle buttrot (*Poria asiatica*), yellow ringrot (*P. weirii*), and white pocketrot (*Fomes pini*) are three of the more important diseases. The species is highly susceptible to winter damage, especially in younger trees. Such damage generally occurs when severe cold waves are followed by mild autumn weather.

CHARACTERISTICS AND PROPERTIES

The wood has a distinct cedary odor and faint bitter taste and is almost always straight-grained and easily

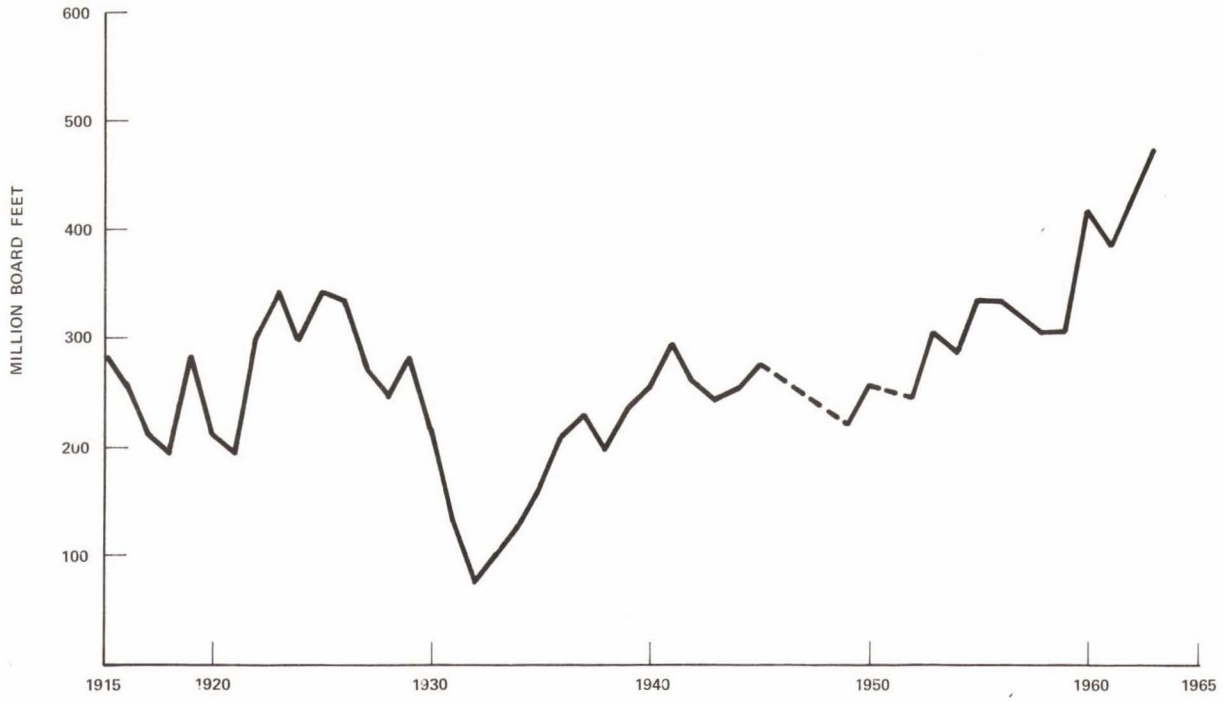

Figure 4.—Western redcedar lumber production.

split. It is moderately soft, moderately weak in bending and edgewise compression, and low in shock resistance. It is relatively easy to dry under mild schedules and shrinks very little.

The sapwood of western redcedar is nearly white and generally very narrow. The heartwood is reddish brown to dull brown, resembling the other cedars and redwood. The heartwood is rated among the best softwoods in both paint-holding ability and natural durability against decay. Also, the heartwood is easily worked with sharp woodworking tools and weighs about 23.4 pounds per cubic foot at 15-percent moisture content.

PRINCIPAL USES

Western redcedar makes fine lumber for decorative uses, especially interior wall paneling. Both knotty and clear grades are used for this purpose. In clear grades, it is one of the two most important lumber species for siding. Also, small quantities are used for window parts and other manufactured products, including novelties. Substantial quantities are used as a face laminate for roof decking. Other applications include caskets, wooden pipe and tanks, outdoor-patio construction, and small outdoor structures where exposure to the weather is severe. It is considered one of the better boatbuilding woods, being used mainly for planking. In thin veneers, it is the principal wood selected for covering racing shells. Western redcedar is a good choice wherever lumber is exposed to conditions favoring decay.

Nearly all of the sawn shingles now manufactured are of western redcedar, as has been the case for nearly 50 years. In addition, the now-popular split roof and siding shakes are frequently made from this species. As has been indicated, this wood also supplies split products, such as fenceposts, fence rails, and grape stakes. It is a principal species for telephone and transmission poles because of its natural durability, straightness, and ease of climbing. Butts of such poles are generally treated to provide additional protection against rot.

Western redcedar is enjoyed by outdoor recreationists, especially in typical cedar groves where the trees attain maximum size and grandeur. The species is also used extensively as an ornamental tree in yard and park landscaping.

REFERENCES

Gill, Thomas G., and Robert B. Phelps.
1969. Wood used in manufacturing industries. U.S. Dep. Agric. Stat. Bull. 440, 101 p., illus.

Harlow, W. M., and E. S. Harrar.
1968. Textbook of dendrology. American Forestry Series. Ed. 5, 512 p., illus. McGraw-Hill Book Co., New York.

Little, Elbert L., Jr.
1953. Checklist of native and naturalized trees of the United States (including Alaska). USDA Agric. Handb. 41, 472 p.

Panshin, A. J., Carl de Zeeuw, and H. P. Brown.
1964. Textbook of wood technology. Vol. I—Structures, identification, uses, and properties of the commercial woods of the United States. Ed. 2, 643 p., illus. McGraw-Hill Book Co., New York.

Setzer, T., and A. Wilson.
1970. Timber products in the Rocky Mountain states, 1966. USDA For. Serv. Res. Bull. INT–9.

USDA Forest Products Laboratory.
1955. Wood handbook. USDA Agric. Handb. 72, 528 p., illus.

USDA Forest Products Laboratory.
1956. Wood—colors and kinds. USDA Agric. Handb. 101, 36 p., illus.

USDA Forest Service.
1965. Timber trends in the United States. USDA For. Serv. Res. Rep. 17, 235 p., illus.

Wilson, A. K.
1963. Commercial pole production in the northern Rocky Mountain area in 1962. USDA For. Serv. Res. Note INT–9.

U.S. Forest Service
Pacific Southwest Library and Information Center
1323 Club Drive
Vallejo, CA 94592-1110

☆ U.S. GOVERNMENT PRINTING OFFICE: 1973 O—506–149

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402—Price: 25 cents, Stock Number 0101–00342